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第1の実施形態におけるサムネイル表示の動作フローチャート

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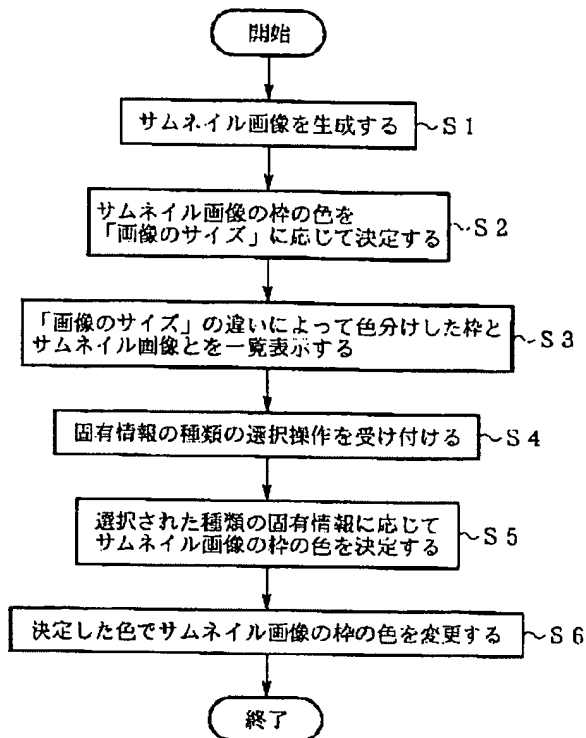
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TITLE : IMAGE DISPLAY DEVICE,
MICROSCOPE SYSTEM PROVIDED
WITH THE IMAGE DISPLAY DEVICE
AND RECORDING MEDIUM



ABSTRACT : PROBLEM TO BE SOLVED: To give display by which contents of proper information of each image can be easily discriminated regardless of size of an image displayed in a synoptic table as for a microscope system provided with an image display device for displaying plural images in the synoptic table by reducing image size and with an image display device for displaying plural images obtained via a microscope in the synoptic table by reducing image size and as for a recording medium which can be read by the computer and in which an image display program for realizing an image display treatment for displaying plural images in a synoptic table by reducing image size by a computer is recorded.

SOLUTION: An information acquiring means acquires plural images and proper information showing intrinsic information attendant on each image. A display means displays plural images in a synoptic table by reducing image size and further gives display of which colors or patterns are changed corresponding to varieties of the proper information to peripheral regions of respective images.

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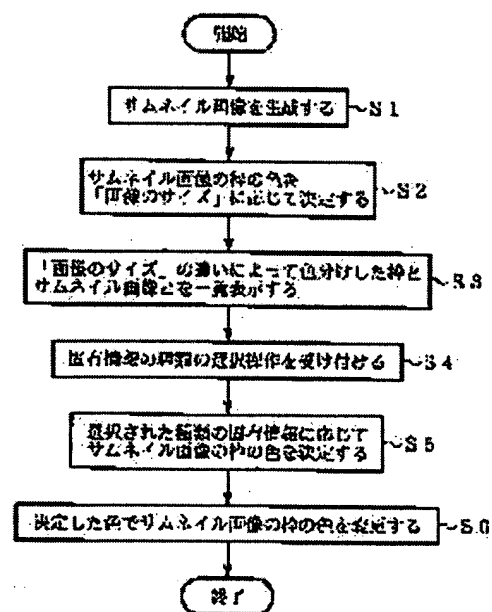
(54) IMAGE DISPLAY DEVICE, MICROSCOPE SYSTEM PROVIDED WITH THE IMAGE DISPLAY DEVICE AND RECORDING MEDIUM

(57)Abstract:

PROBLEM TO BE SOLVED: To give display by which contents of proper information of each image can be easily discriminated regardless of size of an image displayed in a synoptic table as for a microscope system provided with an image display device for displaying plural images in the synoptic table by reducing image size and with an image display device for displaying plural images obtained via a microscope in the synoptic table by reducing image size and as for a recording medium which can be read by the computer and in which an image display program for realizing an image display treatment for displaying plural images in a synoptic table by reducing image size by a computer is recorded.

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CLAIMS

[Claim(s)]

[Claim 1] An image display device characterized by having an information acquisition means to acquire proper information which shows information on a proper which accompanies each of two or more images and this image, and a display means to perform a display which changed a color or a pattern to a boundary region of each image according to a difference in said proper information while reducing said two or more images and indicating by list.

[Claim 2] It is the image display device which is equipped with an information selection means to choose a class of said proper information, in an image display device according to claim 1, and is characterized by said display means changing a color or a pattern of said boundary region according to a difference in proper information corresponding to a class chosen by said information selection means.

[Claim 3] Said display means is an image display device characterized by displaying a color or a pattern corresponding to two or more proper information that classes differ to said boundary region in an image display device according to claim 1.

[Claim 4] An image display device characterized by providing the following. An information acquisition means to acquire proper information which shows information on a proper which accompanies each of two or more images and this image An image selection means to choose at least one image among said two or more images A retrieval means to search an image with which proper information suits using proper information on an image chosen by said image selection means A display means to display a color or a pattern which is different from a boundary region of other images to a boundary region of an image searched by said retrieval means while reducing said two or more images and indicating by list

[Claim 5] The image display device characterized by to have a display means perform the display which changed a shade to a boundary region of each image based on an information acquisition means acquire proper information which shows information on a proper which accompanies each of two or more images and this image, and proper information which can perform sequencing of this image among said proper information while reducing two or more of said images and indicating by list.

[Claim 6] It is the microscope system characterized by an image display device being an image display device given in any 1 term of claim 1 thru/or claim 5 in a microscope system equipped with an image display device which reduces two or more images acquired through a microscope, and indicates by list.

[Claim 7] The record medium which is characterized by to record the image-display program for realizing the information acquisition procedure which acquires the proper information which shows information on a proper which accompanies each of two or more images and this image, and the display procedure perform the display which changed a color or a pattern according to the difference in said proper information to the boundary region of each image while reduce two or more of said images and indicating by list, by the computer and in which computer reading is possible.

[Claim 8] An information acquisition procedure which acquires proper information which shows information on a proper which accompanies each of two or more images and this image, An image selection procedure which chooses at least one image among said two or more images, While reducing a retrieval procedure of searching an image with which proper information suits, and said two or more

images and indicating by list using proper information on an image chosen by said image selection procedure A record medium which is characterized by recording an image display program for realizing a display procedure which displays a different color or a different pattern from a boundary region of other images by computer to a boundary region of an image searched by said retrieval procedure and in which computer reading is possible.

[Claim 9] While reducing an information acquisition procedure which acquires proper information which shows information on a proper which accompanies each of two or more images and this image, and said two or more images and indicating by list A record medium which is characterized by recording an image display program for realizing a display procedure of performing a display which changed a shade to a boundary region of each image, by computer based on proper information which can perform sequencing of this image among said proper information and in which computer reading is possible.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] In this invention, it is related to the record medium which recorded the microscope system equipped with the image display device which reduces two or more images and indicates by list, and the image display device which reduces two or more images acquired through the microscope, and indicates by list, and the image display program for realizing image display processing which reduces two or more images and indicates by list by computer and in which computer reading is possible.

[0002]

[Description of the Prior Art] In order that an operator may make easy to discriminate from the former in the personal computer equipped with the image-processing function two or more images currently recorded beforehand, these images are reduced and indicating by list is performed on the display as a thumbnail image. However, just an operator's thumbnail image is inadequate for identifying a desired image.

[0003] Therefore, the alphabetic character and graphic form equivalent to the proper information (for example, photography years etc.) which shows the information on the proper which accompanies each image came to be displayed on the thumbnail image.

[0004]

[Problem(s) to be Solved by the Invention] However, by the thumbnail image as which such an alphabetic character and a graphic form were displayed, the portion which lapped with the alphabetic character showing the proper information on an image or the graphic form will lose. Then, in order to suppress such loss to the minimum, the viewing area of an alphabetic character or a graphic form is restricted extremely small to the whole thumbnail image.

[0005] Therefore, when each thumbnail image needs to be displayed small, even if it indicates that it increases the number of the thumbnail images made into the object of a list display etc. in magnitude to the extent that the thumbnail image itself can be recognized by the operator, neither an alphabetic character nor a graphic form may be displayed in the magnitude which is like [as which an operator can recognize].

[0006] That is, the alphabetic character and graphic form equivalent to proper information may be displayed with contraction of a thumbnail image so small that an operator cannot recognize, and have a possibility that it cannot use in case a desired image is identified. Then, claim 1 thru/or invention according to claim 5 aim at offering the image display device which can perform the display which can distinguish the contents of the proper information on each image easily regardless of the magnitude of the image by which it is indicated by list.

[0007] Moreover, invention according to claim 6 aims at offering the microscope system equipped with the image display device which can perform the display which can distinguish the contents of the proper information on each image easily regardless of the magnitude of the image by which it is indicated by list. Furthermore, claim 7 thru/or invention according to claim 9 aim at offering the record medium

which recorded the image display program which can perform the display which can distinguish the contents of the proper information on each image easily regardless of the magnitude of the image by which it is indicated by list.

[0008]

[Means for Solving the Problem] Here, although contents corresponding to an operation gestalt mentioned later are shown in a parenthesis, a publication in such a parenthesis does not limit invention. An image display device (the microscope system 10 of the 1st operation gestalt, microscope system 10 of the 2nd operation gestalt) according to claim 1 Information on a proper which accompanies each of two or more images and this image An information acquisition means to acquire shown proper information (an electronic camera 100, a microscope 101, a control panel 102, a bar code reader 103, the interface section 205 for input devices, an external interface 207, a mouse 210, keyboard 211), While reducing said two or more images and indicating by list, it is characterized by having a display means (CPU201, a display and control section 206, display 212) to perform a display which changed a color or a pattern, to a boundary region (frame) of each image according to a difference in said proper information.

[0009] However, in claim 1, the alphabetic character itself which shows proper information shall not be contained in a pattern. Moreover, a display from which a shade differs shall be included in a display from which a color differs, and a display of a frame with which sizes differ shall be included in a display from which a pattern differs. An image display device (microscope system 10 of the 1st operation gestalt) according to claim 2 is equipped with an information selection means (an external interface 207, a mouse 210, keyboard 211) to choose a class of said proper information, in an image display device according to claim 1, and said display means is characterized by changing a color or a pattern of said boundary region according to a difference in proper information corresponding to a class chosen by said information selection means.

[0010] An image display device (microscope system 10 of the 2nd operation gestalt) according to claim 3 is characterized by said display means displaying a color or a pattern corresponding to two or more proper information that classes differ, to said boundary region in an image display device according to claim 1. An image display device (microscope system 10 of the 3rd operation gestalt) according to claim 4 An information acquisition means to acquire proper information which shows information on a proper which accompanies each of two or more images and this image, An image selection means to choose at least one image among said two or more images, While reducing a retrieval means (CPU201) to search an image with which proper information suits, and said two or more images and indicating by list using proper information on an image chosen by said image selection means It is characterized by having a display means to display a different color or a different pattern from a boundary region of other images, to a boundary region of an image searched by said retrieval means.

[0011] An image display device (the microscope system 10 of the 4th operation gestalt, microscope system 10 of the 5th operation gestalt) according to claim 5 While reducing an information acquisition means to acquire proper information which shows information on a proper which accompanies each of two or more images and this image, and said two or more images and indicating by list Proper information which can perform sequencing of this image among said proper information (proper information which shows sequence of photography at the time of timelapse photography: photography time of day, coma number, etc.) Sequencing proper information: Size of an image, the magnification of objective, photography years, etc. It is based and is characterized by having a display means to perform a display which changed a shade to a boundary region of each image.

[0012] In a microscope system equipped with an image display device which a microscope system equipped with an image display device according to claim 6 reduces two or more images acquired through a microscope, and indicates by list, an image display device is characterized by being an image display device given in any 1 term of claim 1 thru/or claim 5. While a record medium according to claim 7 reduces an information acquisition procedure which acquires proper information which shows information on a proper which accompanies each of two or more images and this image, and said two or more images and indicates by list It is characterized by recording an image display program for realizing

a display procedure of performing a display which changed a color or a pattern, by computer to a boundary region of each image according to a difference in said proper information.

[0013] An information acquisition procedure which acquires proper information which shows information on a proper that a record medium according to claim 8 accompanies each of two or more images and this image, An image selection procedure which chooses at least one image among said two or more images, While reducing a retrieval procedure of searching an image with which proper information suits, and said two or more images and indicating by list using proper information on an image chosen by said image selection procedure It is characterized by recording an image display program for realizing a display procedure which displays a different color or a different pattern from a boundary region of other images by computer to a boundary region of an image searched by said retrieval procedure.

[0014] While a record medium according to claim 9 reduces an information acquisition procedure which acquires proper information which shows information on a proper which accompanies each of two or more images and this image, and said two or more images and indicates by list It is characterized by recording an image display program for realizing a display procedure of performing a display which changed a shade to a boundary region of each image, by computer based on proper information which can perform sequencing of this image among said proper information.

[0015]

[Embodiment of the Invention] Hereafter, although detailed explanation is given about the operation gestalt of this invention based on a drawing, below, the microscope system equipped with the personal computer is explained as an example of the image display device of this invention. However, the image display program recorded on the record medium of this invention shall be beforehand installed in a personal computer.

[0016] In addition, the image display device of this invention is not limited to such a microscope system, and if it is equipment which reduces and carries out the table of two or more images, it is applicable to anythings. Drawing 1 is microscope structure-of-a-system drawing. In drawing 1, it has the microscope 101 equipped with the electronic camera 100 which the microscope system 10 photos a sample and generates microscope image data, and the personal computer 200, and the control panel 102 and the bar code reader 103 are connected to the microscope 101.

[0017] A control panel 102 receives a setup of the photography conditions of the electronic camera 100 by the operator, a setup of the amount of adjustments to the controllers-ed of a microscope 101 (for example, an electric revolver, an electric stage, etc.), etc., and a bar code reader 103 reads the bar code stuck on the prepared slide on which the sample was put. The control section (illustration abbreviation) is built in the microscope 101, according to various setup received with the control panel 102, the controller-ed of a microscope 101 is controlled automatically, or this control section has the function to manage the information (for example, sample ID etc.) which the bar code read by the bar code reader 103 shows. Moreover, a control section collects the information which such a bar code shows, and the information which shows the condition of the controller-ed of a microscope 101, and has the function supplied to a personal computer 200 as proper information.

[0018] The control section (illustration abbreviation) is built also in the electronic camera 101, and when a sample is photoed by the electronic camera 100, this control section collects the time and the photography conditions (the size of an image, the format of an image, etc. are included) of an electronic camera 100 that photography was performed, and has the function supplied to a personal computer 200 as proper information.

[0019] A personal computer 200 has CPU201, and while main memory 202 and ROM203 are connected, the interface section 205 for input devices, a display and control section 206, the external-interface section 207, and a hard disk 208 are connected to CPU201 through the bus 204. The interface section 205 for input devices is connected to a mouse 210 and a keyboard 211, a display and control section 206 is connected to a display 212, and the external-interface section 207 is connected to the control section in an electronic camera 100 and a microscope 101.

[0020] Moreover, OS into which GUI (Graphical User Interface) was introduced shall be carried in the

personal computer 200, and a display and control section 206 shall display various kinds of actuation screens (a combo box, menu, etc.) on a display 212 based on directions of CPU201. In such a microscope system 10 of a configuration, the microscope image data generated by the electronic camera 100 and the proper information supplied from the control section in a microscope 101 and an electronic camera 101 are incorporated by the personal computer 200 through the external-interface section 207, and is saved as a file (a "microscope image file" is called hereafter.) at a hard disk 208.

[0021] In addition, in the microscope system 10, at the time of the injection of a power supply, and initiation of a speculum, the product name of an electronic camera 100 and a microscope 101 shall be incorporated by the personal computer 200, and an identifier shall be inputted by the user. Although such a product name of an electronic camera 100 and a microscope 101 and a user's identifier (it is equivalent to the photography person name of a microscope image) are saved at a hard disk 208, they are used as proper information on a microscope image file after photography of a sample.

[0022] That is, the microscope image file of format whenever photography of a sample is performed, as shown in drawing 2 will be generated by the hard disk 208. In addition, the proper information in a microscope image file may also include the information which the bar code stuck not only on a thing but on the prepared slide shown in drawing 2 shows, photography modes (for example, timelapse photography, standard photography, etc.), the information in connection with the speculum inputted by the user, etc.

[0023] Hereafter, actuation of each operation gestalt is explained based on a drawing. However, since the feature of this invention is in the method of a list display of two or more images currently recorded beforehand, below, it explains the actuation performed by CPU201 in the case of a thumbnail display, and omits explanation about other actuation. Moreover, it shall be beforehand set up by the operator through the actuation screen for a mode switch of a thumbnail display whether thumbnail display [which] is performed among the thumbnail displays in each operation gestalt mentioned later.

[0024] << -- explanation >> of the 1st operation gestalt -- drawing 3 is the operation flow chart of the thumbnail display in the 1st operation gestalt. Hereafter, actuation of the 1st operation gestalt is explained with reference to drawing 3. First, CPU201 will generate two or more thumbnail images using the microscope image data stored in two or more microscope image files according to the individual, if a thumbnail display is demanded by the operator (drawing 3 S1).

[0025] Moreover, from two or more proper information stored in each microscope image file, CPU201 reads the proper information corresponding to "size of an image", and determines the color of the frame of each thumbnail image according to "size of an image" with reference to the "color conversion table" of format as shown in drawing 4 (drawing 3 S2). A "color conversion table" is a table showing the color corresponding to "size of an image", and other proper information, and matching with proper information and a color is beforehand made by initial setting. In addition, matching with such proper information and a color is taken as what has possible changing by the manager of the microscope system 10 etc. through a predetermined actuation screen. Moreover, about the proper information which is not set as the "color conversion table", the colors (for example, white, black, etc.) which show un-setting up shall be matched.

[0026] To the microscope image data whose "size of an image" is "640x512", CPU201 makes the frame of a thumbnail image "red", and makes the color of the frame of a thumbnail image "yellowish green" to the microscope image data whose "size of an image" is "1280x1024." That is, the frame of each thumbnail image will be classified by color by the difference in "size of an image."

[0027] Next, CPU201 indicates by list the frame and thumbnail image which were classified by color by the difference in "size of an image" through a display and control section 206 at a display 212 (drawing 3 S3). That is, when a thumbnail display is required from an operator, the thumbnail image with which the frame classified by color by the difference in "size of an image" was given will be displayed on a display 212. Therefore, an operator can distinguish easily the difference in the size of the microscope image corresponding to each thumbnail image. Moreover, a microscope image especially with large size is discriminable.

[0028] In addition, as for classification by color of the frame of the thumbnail image displayed

immediately after requiring a thumbnail display from an operator, it is desirable for "not only the size of an image" but a user to carry out using the proper information to which importance is attached most, and let such proper information be what has possible changing by the manager of the microscope system 10 etc. through a predetermined actuation screen. Next, CPU201 displays the actuation screen in connection with selection of the class of proper information on a display 212 through a display and control section 206, and selection actuation of the class of proper information by the operator is received through the interface section for input devices (drawing 3 S4).

[0029] For example, CPU210 displays the combo box 300 (list of the classes of proper information) shown in drawing 5 as an actuation screen in connection with selection of the class of proper information, and receives selection actuation of the class of proper information by the operator.

[0030] In addition, such selection actuation is equivalent to actuation of setting up the class of proper information used as the criteria of classification by color of the frame of a thumbnail image. When predetermined actuation (for example, a mouse 210 is right-clicked) is performed, CPU210 then, like drawing 6 The menu 400 including "a setup of classification by color" is displayed through a display and control section 206. Then, when "a setup of classification by color" is chosen by the operator, the menu 401 which consists of the class of two or more proper information may be displayed through a display and control section 206, and selection actuation of the class of proper information by the operator may be received.

[0031] Next, CPU210 reads the proper information corresponding to the class chosen by the operator from two or more proper information stored in each microscope file, and the color of the frame of each thumbnail image is determined according to proper information with reference to the "color conversion table" of format as shown in drawing 4 (drawing 3 S5). For example, when the "magnification of objective" is chosen by the operator, from each microscope file, reading appearance of the information corresponding to the "magnification of objective" is carried out, and the color of the frame of each thumbnail image is determined according to the "magnification of objective" based on a "color conversion table."

[0032] And the color of the frame of each thumbnail image is changed by the color which carried out CPU210 in this way, and was determined (drawing 3 S6). For example, when the "magnification of objective" is chosen by the operator, the frame of the thumbnail image whose "magnification of objective" "size of an image" is "640x512" and is "x20" will be changed into "yellowish green" from "red."

[0033] As explained above, in the thumbnail display in the 1st operation gestalt, the frame of a thumbnail image can be classified by color according to the difference in predetermined proper information (it is equivalent to "size of an image"), and the difference in the proper information chosen by the operator. Therefore, even if it is the case where many small thumbnail images are displayed, an operator can recognize certainly the difference in the proper information corresponding to each thumbnail image by the difference in the color of a frame.

[0034] In addition, as an initial state of a thumbnail display immediately after requiring a thumbnail display from an operator, although the frame and thumbnail image which were classified by color by the difference in "size of an image" are displayed, by such initial state, a thumbnail image without a frame may be expressed as the 1st operation gestalt. Moreover, with the 1st operation gestalt, where the frame and thumbnail image which were classified by color according to proper information are displayed (condition after drawing 3 S3 and drawing 3 S6 were performed), when any one thumbnail image is chosen by the operator, the frame of the thumbnail image and the frame of the same color may be blinked by him.

[0035] For example, when a thumbnail image is chosen by the operator after drawing 3 S3 is performed, CPU201 blinks the frame of the thumbnail image in which the same "size of an image" as the thumbnail image is shown. Moreover, when a thumbnail image is chosen by the operator after a "photography person name" is chosen in drawing 3 S4 and drawing 3 S5 and drawing 3 S6 are performed, CPU201 blinks the frame of the thumbnail image in which the same "photography person name" as the thumbnail image is shown.

[0036] Therefore, even if it is the case where many small thumbnail images are displayed, an operator can distinguish a thumbnail image with the same proper information easily by flashing of a frame.

<< -- explanation>> of the 2nd operation gestalt -- drawing 7 is the operation flow chart of the thumbnail display in the 2nd operation gestalt.

[0037] Hereafter, actuation of the 2nd operation gestalt is explained with reference to drawing 7. First, CPU201 will generate two or more thumbnail images using the microscope image data stored in two or more microscope image files according to the individual, if a thumbnail display is demanded by the operator (drawing 7 S1). Moreover, CPU201 reads two or more proper information stored in each microscope image file, and the color corresponding to an individual exception is determined as two or more proper information for every thumbnail image with reference to the "color conversion table" of format as shown in drawing 4 (drawing 7 S2). Furthermore, CPU201 arranges the color which carried out in this way and was determined in predetermined order, and creates a frame for every thumbnail image (drawing 7 S3).

[0038] For example, as shown in (1) of drawing 8, CPU201 creates the frame with which the color corresponding to an individual exception is arranged by two or more proper information at a single tier, and grows into it at one side of the rectangle surrounding a thumbnail image, or as shown in drawing 8 (2), it creates the frame which is arranged and changes so that the color corresponding to an individual exception may surround a thumbnail image to two or more proper information. In addition, arrangement of the proper information in the frame of such a thumbnail image may be the arrangement beforehand set up by the manager of the microscope system 10 etc. not only through the example of drawing 8 (1) and drawing 8 (2) but through the predetermined actuation screen. Moreover, the proper information matched with the frame of a thumbnail image may be all the proper information stored in the microscope image file, and may be proper information beforehand chosen by the manager of the microscope system 10 etc. through the predetermined actuation screen.

[0039] Next, CPU201 indicates the frame and thumbnail image which carried out in this way and were created by list through a display and control section 206 at a display 212 (drawing 7 S4). That is, in the thumbnail display in the 2nd operation gestalt, the frame which consists of the color corresponding to two or more proper information will be matched for every thumbnail image. Therefore, an operator can recognize easily the difference in the proper information corresponding to each thumbnail image by the difference in such an array of the color of a frame.

[0040] in addition, with the 1st operation gestalt and the 2nd operation gestalt which were mentioned above Although the color corresponding to proper information is determined in the case of a thumbnail display (it is equivalent to drawing 3 S2, drawing 3 S5, and drawing 7 S2), the color corresponding to all proper information is determined in the case of generation of a microscope image file. If stored in the microscope image file in the format that the result is shown in drawing 9, it is not necessary to make the decision of the color corresponding to proper information in the case of a thumbnail display.

[0041] << -- explanation>> of the 3rd operation gestalt -- drawing 10 is the operation flow chart of the thumbnail display in the 3rd operation gestalt. Hereafter, actuation of the 3rd operation gestalt is explained with reference to drawing 10. However, the 1st color shown below, the 2nd color, and the 3rd color (for example, white, red, blue, etc.) are colors beforehand determined by initial setting, and let them be what has possible changing by the manager of the microscope system 10 etc. through a predetermined actuation screen.

[0042] First, CPU201 will generate two or more thumbnail images using the microscope image data stored in two or more microscope image files according to the individual, if a thumbnail display is demanded by the operator (drawing 10 S1). And CPU201 indicates the frame and thumbnail image of the 1st color by list through a display and control section 206 at a display 212 (drawing 10 S2).

[0043] Next, CPU201 receives selection actuation of the thumbnail image by the operator through the interface section for input devices (drawing 10 S3), and changes into the 2nd color the frame of the thumbnail image (a "selection thumbnail image" is called hereafter) chosen by the operator (drawing 10 S4). Next, like the 1st operation gestalt, CPU201 displays the actuation screen in connection with selection of the class of proper information on a display 212 through a display and control section 206,

and receives selection actuation of the class of proper information by the operator through the interface section for input devices (drawing 10 S5).

[0044] And CPU201 searches a "selection thumbnail image" and the thumbnail image (an "adaptation thumbnail image" is called hereafter) with which proper information suits from two or more thumbnail images by which it is indicated by the list with reference to the proper information corresponding to the class chosen as two or more microscope image files by the operator among two or more proper information stored according to the individual (drawing 10 S6).

[0045] Next, CPU201 makes the frame of an "adaptation thumbnail image" the 3rd color (drawing 10 S7). For example, like drawing 11 (1), where a list indication of the frame and thumbnail image of the 1st color is given (condition after drawing 10 S2 was performed), when the thumbnail image of (a) is chosen by the operator, the frame of each thumbnail image will change with them like drawing 11 (2). Moreover, when the thumbnail image of (a) and the thumbnail image with which proper information suits are (c), the frame of each thumbnail image will change like drawing 11 (3).

[0046] Next, CPU201 judges whether a setup of flashing of the frame of an "adaptation thumbnail image" is performed (drawing 10 S8). In addition, a setup of flashing of the frame of an "adaptation thumbnail image" shall be beforehand performed by the manager of the microscope system 10 etc. through a predetermined actuation screen. And CPU201 blinks the frame of an "adaptation thumbnail image", when a setup of flashing of the frame of an "adaptation thumbnail image" is performed (drawing 10 S9).

[0047] As explained above, in the thumbnail display in the 3rd operation gestalt, the frame of a "selection thumbnail image" and the frame of an "adaptation thumbnail image" can be changed into a different color from the frame of other thumbnail images. Moreover, it is possible to blink the frame of an "adaptation thumbnail image" in the thumbnail display in the 3rd operation gestalt. Therefore, even if it is the case where many small thumbnail images are displayed, an operator can distinguish easily a specific thumbnail image and the thumbnail image with which proper information suits by the difference in the color of a frame, or flashing of a frame.

[0048] In addition, as an initial state of a thumbnail display immediately after requiring a thumbnail display from an operator, although the frame and thumbnail image of the 1st color are displayed, by such initial state, a thumbnail image without a frame may be expressed as the 3rd operation gestalt. Moreover, although the frame of a "selection thumbnail image" is made into the 2nd color and the frame of an "adaptation thumbnail image" is made into the 3rd color with the 3rd operation gestalt, as long as the color of these frames is a different color from the 1st color (color of the frame displayed in drawing 10 S2), it may be the same color.

[0049] Furthermore, although not clearly written about the number of the classes of proper information chosen by the operator with the 3rd operation gestalt, the number of such classes is not limited to one. For example, when the class of two or more proper information is chosen by the operator in drawing 10 S3, in drawing 10 S5, CPU210 may search the thumbnail image with which the proper information corresponding to at least one class suits among two or more classes, and may search the thumbnail image with which the proper information corresponding to two or more classes of all suits.

[0050] Moreover, although one frame is matched with one thumbnail image in the thumbnail display in the 1st operation gestalt thru/or the 3rd operation gestalt mentioned above. For example, the frame matched with one thumbnail image, such as arranging the frame shown in the 3rd operation gestalt on the outside of the frame shown in the 1st operation gestalt, may be a frame which combined each frame shown in the 1st operation gestalt thru/or the 3rd operation gestalt.

[0051] Furthermore, in the thumbnail display in the 1st operation gestalt thru/or the 3rd operation gestalt mentioned above, although the difference in the color of a frame shows the difference in proper information, the difference in the shade of a frame, the pattern of a frame, and the difference in a size may show the difference in proper information.

<< -- explanation >> of the 4th operation gestalt -- drawing 12 is the operation flow chart of the thumbnail display in the 4th operation gestalt.

[0052] Hereafter, actuation of the 4th operation gestalt is explained with reference to drawing 12 . First,

if the thumbnail display of timelapse photography is demanded by the operator, from two or more microscope image files created at the time of timelapse photography, CPU201 will read microscope image data and will generate the thumbnail image corresponding to each coma of timelapse photography (drawing 12 S1).

[0053] And CPU201 creates the frame in which a shade carries out adjustable to the photoed order to the thumbnail image corresponding to each coma based on the proper information (for example, photography time of day, a coma number, etc.) which shows the sequence of the photography at the time of timelapse photography (drawing 12 S2). However, in creation of such a frame, CPU201 creates the frame of the lightest color (or deepest color) in the thumbnail image corresponding to the coma of the beginning of timelapse photography, creates the frame of the deepest color (or lightest color) in the thumbnail image corresponding to the last coma, and creates the frame of a color from which a shade changes equally in each thumbnail image corresponding to a middle coma.

[0054] Next, CPU201 indicates the frame and thumbnail image which carried out in this way and were created by list through a display and control section 206 at a display 212 (drawing 12 S3). That is, with the 4th operation gestalt, a thumbnail display as shown in drawing 13 will be performed. As explained above, in the thumbnail display in the 4th operation gestalt, the frame gradation carries out [a frame] adjustable according to the passage of time at the time of photography will be given for every thumbnail image corresponding to each microscope image data obtained by timelapse photography. Therefore, it is not necessary to display the graphic form in which a clock is shown on a thumbnail image in the thumbnail display in the 4th operation gestalt.

[0055] Therefore, even if it is the case where many small thumbnail images are displayed, an operator can match easily each thumbnail image and passage of time at the time of timelapse photography by the shade of a frame. By the way, when the number of gradation of a display 212 is 256, the frame of a thumbnail image is shown by 256 gradation. In such a case, if the number of coma of timelapse photography exceeds 256, the frame with which gradation differs can be matched with no thumbnail images. Then, CPU201 shall make the same gradation the frame of the thumbnail image corresponding to two or more continuous microscope images, when the number of coma of timelapse photography exceeds the number of gradation.

[0056] For example, when the frame of the thumbnail image corresponding to two or more coma photoed in the end of a series of timelapse photography is made into the same gradation when the number of coma exceeds a little number of gradation, or the number of coma is about 2 times of the number of gradation, it is good to make into the same gradation the frame of the thumbnail image corresponding to the coma which is continuous two. In addition, although by carrying out adjustable [of the shade of the frame of a thumbnail image] continuously shows the passage of time at the time of timelapse photography by the thumbnail display in the 4th operation gestalt, by carrying out adjustable [of the size of the frame of a thumbnail image] continuously may show such the passage of time.

[0057] << -- explanation >> of the 5th operation gestalt -- drawing 14 is the operation flow chart of the thumbnail display in the 5th operation gestalt. Hereafter, actuation of the 5th operation gestalt is explained with reference to drawing 14 . First, if a thumbnail display is demanded by the operator, CPU201 will generate two or more thumbnail images using the microscope image data stored in two or more microscope image files according to the individual, and will indicate these thumbnail images by list through a display and control section 206 at a display 212 (drawing 14 S1).

[0058] Next, like the 1st operation gestalt, CPU201 displays the actuation screen in connection with selection of the class of proper information on a display 212 through a display and control section 206, and receives selection actuation of the class of proper information by the operator through the interface section for input devices (drawing 14 S2). And CPU210 reads the proper information corresponding to the class chosen by the operator from two or more proper information stored in each microscope file, and it rearranges each thumbnail image so that the thumbnail image whose proper information corresponds may be arranged in near (drawing 14 S3).

[0059] Moreover, CPU210 matches with each thumbnail image the frame classified by color by the difference in such proper information (drawing 14 S4). In addition, the color of such a frame may be

performed with reference to the "color conversion table" of format as shown in drawing 4 , and the proper information on the class chosen by the operator may match two or more colors decided beforehand for every match.

[0060] Next, CPU210 displays the actuation screen in connection with selection of the proper information ("sequencing proper information" is called hereafter) which can perform sequencing of a microscope image among two or more proper information on a display 212 through a display and control section 206, and selection actuation of the class of "sequencing proper information" by the operator is received through the interface section for input devices (drawing 14 S5).

[0061] For example, as a class of "sequencing proper information", "size of an image", the "magnification of objective", "photography years", etc. are mentioned. And CPU210 carries out adjustable [of the shade of the frame in each thumbnail image] while rearranging the thumbnail image with which the frame of the same color is given according to the "sequencing proper information" corresponding to the class chosen by the operator (drawing 14 S6).

[0062] For example, if a "photography person name" is chosen in drawing 14 S2, each thumbnail image will be rearranged for every thing in which a "photography person name" is common. And if "size of an image" is chosen in drawing 14 S5, "size of an image" will be rearranged into small order (or descending), and the thumbnail image (thumbnail image with which the frame of the same color is given) with which a "photography person name" is common will be displayed with the frame with which adjustable [of the shade] is carried out for "size of an image" to small order (or descending).

[0063] That is, with the 5th operation gestalt, a thumbnail display as shown in drawing 15 will be performed. As explained above, in the thumbnail display in the 5th operation gestalt, the frame gradation carries out [a frame] adjustable according to the difference in "sequencing proper information" will be given for every thumbnail image.

[0064] therefore, even if it is the case where many small thumbnail images are displayed, an operator can recognize easily the difference in "sequencing proper information" which is alike and corresponds to each thumbnail image by the shade of a frame. In addition, although by carrying out adjustable [of the shade of the frame of a thumbnail image] continuously shows the difference in "sequencing proper information" by the thumbnail display in the 5th operation gestalt, by carrying out adjustable [of the size of the frame of a thumbnail image] continuously may show such a difference.

[0065] Moreover, although the color and shade of a frame in all the thumbnail images by which it is beforehand indicated by the list are changed in the thumbnail display in the 5th operation gestalt, it is possible to replace with processing of drawing 15 S2 - S4, and to, display only the thumbnail image chosen by the operator for example, with the frame in which a shade carries out adjustable using "sequencing proper information", if the processing 1 and processing 2 which are shown below are performed.

[0066] - Processing 1:CPU201 receives selection actuation (for example, click of a mouse 210 etc.) of the thumbnail image by the operator through the interface section for input devices.

- Processing 2:CPU201 indicates the frame of the same color beforehand decided to be the thumbnail image chosen by the operator by list through a display and control section 206 at a display 212.

[0067]

[Effect of the Invention] As explained above, in claim 1 thru/or claim 3, claim 6, and invention according to claim 7, proper information is different, it can respond and the color or pattern of a boundary region of an image which should indicate by list can be changed. Moreover, by invention of a publication, the color or pattern of a boundary region of an image that proper information is common is changeable into claim 4, claim 6, and claim 8 with the boundary region of other images. Furthermore, in claim 5, claim 6, and invention according to claim 9, the shade of the boundary region of each image is changeable based on the proper information which can set in order.

[0068] Discernment according to an operator regardless of the magnitude of an image is possible for the difference between the color in such a boundary region, or a pattern, and the difference in a shade. Therefore, even if an operator is the case where an image is displayed small, he only looks at the color and pattern of a boundary region of an image, and a shade, and can distinguish each image.

[Translation done.]